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~~4th Quarter~~
1992 **NOV**

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**Fourth Quarter 1992
Ground Water Sampling Results
Livingston Rail Yard
Livingston, Montana**

Submitted to:

**Montana Department of Health and
Environmental Sciences**
Solid and Hazardous Waste Bureau
Cogswell Building
Helena, Montana 59620

Submitted by:

Burlington Northern Railroad
9401 Indian Creek Parkway
Overland Park, Kansas 66201

Prepared by:

Envirocon, Inc.
P.O. Box 8243
Missoula, Montana 59807

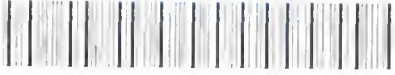
Submittal Date:

February 18, 1993

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1.0 INTRODUCTION

This report presents the results of ground water samples collected within and around the Livingston Rail Yard, in Livingston, Montana, during the fourth quarter of 1992. Ground water sampling for this quarter consisted of the November semiannual sampling event. Burlington Northern Railroad's revised Ground Water Sampling Plan, instituted in July 1992, does not require ground water sampling during October or December.

2.0 RESULTS

The samples were analyzed by Energy Laboratories, Inc. in Billings, Montana. Results for the November semiannual sampling event are presented below.

2.1 November 1992 Semiannual Ground Water Sampling Event

The November 1992 semiannual sampling event was conducted on November 24 through December 2, 1992. Twenty-two samples were analyzed as part of this event: 19 primary samples and two duplicate samples collected at monitoring wells within and around the Livingston Rail Yard and one trip blank. The locations of these wells are shown on Figure 1.0. All samples were analyzed for purgeable halocarbons by EPA Method 601. Tables 1, 2, 3, and 4 summarize quarterly analytical results for tetrachloroethene (PCE); trichloroethene (TCE); cis-1,2-dichloroethene (DCE); and chlorobenzene, respectively. Laboratory analytical results and a data validation report for this sampling event are in Appendix A. Monitoring Well LS-8 was abandoned during sludge removal at the overflow pond in October 1992 and therefore could not be sampled during the November 1992 semiannual sampling round.

All other monitoring wells listed for semiannual sampling in the revised Ground Water Sampling Plan were sampled during November 1992.

Most of the ground water samples collected during the November 1992 semiannual sampling round contained dissolved chlorinated-VOC concentrations that continued the general decline observed during the past three years. Notable concentration changes in wells with sufficient previous sample data are described below.

The November 1992 PCE concentration in the sample from Monitoring Well L-87-5 was 72 parts per billion (ppb). This is 53 percent lower than the average PCE concentration at this well in the past year and 76 percent lower than the average PCE concentration at this well between May 1989 and May 1992, reported in the Final Draft Remedial Investigation Report (FDRI).

The November 1992 PCE concentration in the sample from Monitoring Well 89-9 was 130 ppb. This is 30 percent lower than the average PCE concentration at this well in the past year and 50 percent lower than the average PCE concentration at this well between February 1990 and May 1992, reported in the FDRI.

The November 1992 PCE concentration in the sample from Monitoring Well 92-1 was 160 ppb. As shown on Table 1, PCE concentrations at this well have shown a decline from the 850-ppb value measured in February 1992 prior to the installation of a soil vapor extraction system at the Locomotive Shop manways.

The sample from Monitoring Well 92-3 did not contain any detectable VOCs during the November 1992 sampling round. This well was installed in July 1992 to investigate VOC concentrations in this part of the LRY. As



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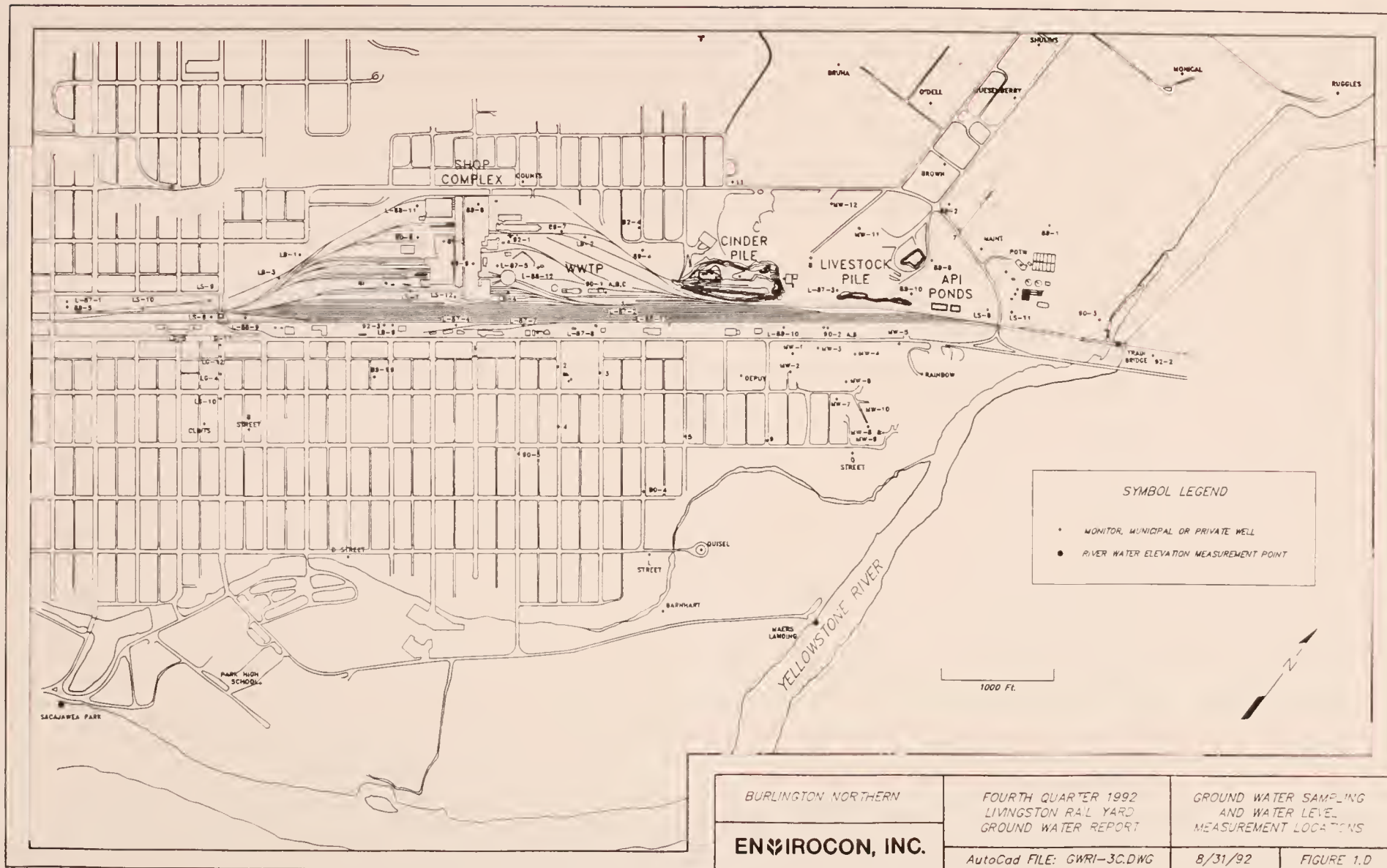
<https://archive.org/details/monthlygroundwat1992mont>

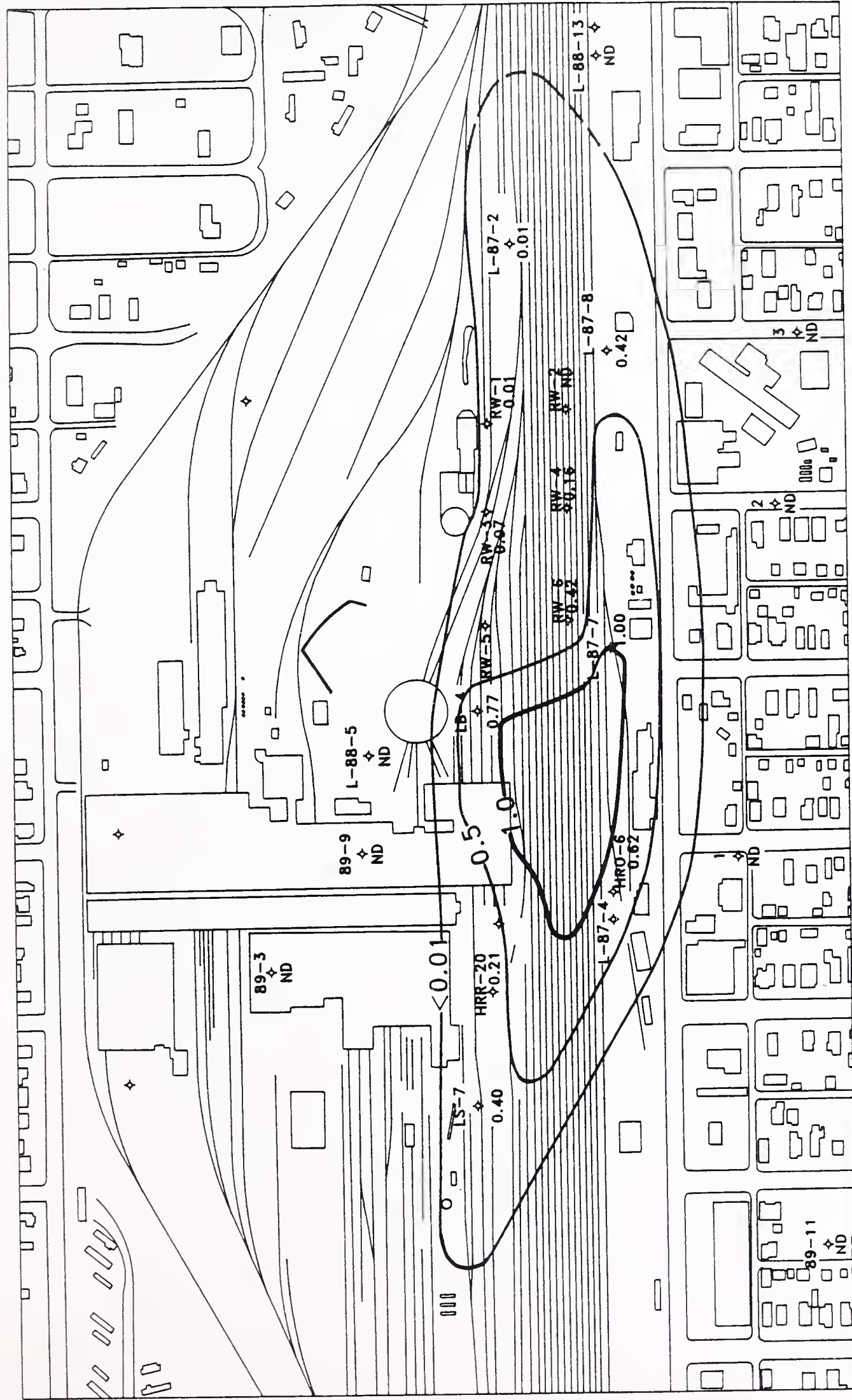
shown on Table 1, the only previous sample collected at this location (August 1992) contained 1.2 ppb of PCE.

2.2 Free-Product Thickness Measurements

Free-product thicknesses were measured at wells sampled within the free-product plume during the November 1992 semiannual sampling round. However, a more complete set of free-product thickness measurements were taken in early January 1993. January 1993 measurements also included wells that were part of the pilot-scale hydrocarbon recovery system and the trench recovery system. Therefore, the early January 1993 measurements were used to construct Figure 2.0, showing the product thicknesses in the free-product plume.

FIGURES





SYMBOL LEGEND

- LS-7 EXISTING WELL & AVERAGE PRODUCT THICKNESS (feet) 5/89 - 5/91
- 0.29 "ND" INDICATES NON-DETECTABLE
- 0.5- APPARENT PRODUCT THICKNESS CONTOUR (thickness in feet)



0 450
SCALE IN FEET

BURLINGTON NORTHERN

ENVIROCON, INC.

FOURTH QUARTER 1992
GROUND WATER REPORT
LIVINGSTON RAIL YARD

AutoCad FILE: GWRI-3D.DWG

EXTENT & APPARENT FREE
PRODUCT THICKNESS OF THE
FREE PRODUCT PLUME
FOURTH QUARTER 1992

1/21/93

FIGURE 2.0

TABLES

Table 1: Tetrachloroethene Analytical Results for Ground-Water Samples Collected During Quarterly Sampling Rounds, Livingston Rail Yard, Livingston, Montana.

Chemical Parameter:		<i>Tetrachloroethene</i>				Units: <i>ug/L</i>	
Monitoring Well	1992 February Quarterly	1992 May Quarterly	1992 August Quarterly	1992 November Quarterly			
5	0.52 B	< 0.5 B	< 0.5 B	< 0.5 B			
89-2	< 0.5 B	< 0.5 B	< 0.5 B	< 0.5 B			
89-3	180.0 B	260.0 B	170.0 U	190.0 B			
89-4	240.0 B	210.0 B	160.0 B	200.0 B			
89-9	200.0 B	180.0 B	170.0 B	130.0 B			
90-6	-	< 0.5 B	0.54 B	0.72 B			
92-1	850.0 B	520.0 B	220.0 B	160.0 B			
92-2	-	15.0 B	41.0 B	37.0 B			
92-3	-	-	1.2 B	< 0.5 B			
92-4	-	-	2.2 B	4.1 B			
HRO-17	-	62.0 B	86.0 B	-			
L-87-2	2.2 B	-	< 0.5 B	10.0 B			
L-87-3	140.0 B	140.0 A	80.0 B	110.0 B			
L-87-5	150.0 B	-	160.0 B	72.0 B			
L-87-8	16.0 B	11.0 B	6.2 B	5.8 B			
L-88-10	115.0 B	-	71.0 B	81.0 B			
LS-11	38.0 B	75.0 B	14.0 B	11.0 B			
LS-8	74.0 B	73.0 B	66.0 B	-			

Table 2: Trichloroethene Analytical Results for Ground-Water Samples Collected During Quarterly Sampling Rounds, Livingston Rail Yard, Livingston, Montana.

Chemical Parameter:		<i>Trichloroethene</i>		Units: <i>ug/L</i>	
<u>Monitoring Well</u>	<u>1992 February Quarterly</u>	<u>1992 May Quarterly</u>	<u>1992 August Quarterly</u>	<u>1992 November Quarterly</u>	
5	< 0.5 B	< 0.5 B	< 0.5 B	< 0.5 B	
89-2	< 0.5 B	< 0.5 B	< 0.5 B	< 0.5 B	
89-3	0.58 B	0.8 B	0.9 B	< 0.5 B	
89-4	5.9 B	4.1 B	3.2 B	2.9 B	
89-9	6.1 B	8.3 B	9.1 B	6.3 B	
90-6	-	< 0.5 B	< 0.5 B	< 0.5 B	
92-1	0.76 B	0.8 B	< 0.5 B	< 0.5 B	
92-2	-	1.0 B	8.4 B	3.8 B	
92-3	-	-	< 0.5 B	< 0.5 B	
92-4	-	-	< 0.5 B	1.1 B	
HRO-17	-	5.3 B	16.0 B	-	
L-87-2	12.0 B	-	7.6 B	11.0 B	
L-87-3	12.0 B	14.0 B	9.7 B	11.0 B	
L-87-5	5.8 B	-	9.0 B	4.3 B	
L-87-8	7.0 B	2.6 B	0.93 B	0.94 B	
L-88-10	16.0 B	-	14.0 B	20.0 B	
LS-11	8.8 B	11.0 B	14.0 B	12.0 B	
LS-8	13.0 B	10.0 B	4.7 B	-	

Table 3: cis-1,2-Dichloroethene Analytical Results for Ground-Water Samples Collected During Quarterly Sampling Rounds, Livingston Rail Yard, Livingston, Montana.

Chemical Parameter:		<i>cis-1,2-Dichloroethene</i>		Units: <i>ug/L</i>	
Monitoring Well	1992 February Quarterly	1992 May Quarterly	1992 August Quarterly	1992 November Quarterly	
5	< 1.0 B	< 1.0 B	< 1.0 B	< 1.0 B	
89-2	< 1.0 B	< 1.0 B	< 1.0 B	< 1.0 B	
89-3	< 1.0 B	1.0 B	1.0 B	< 1.0 B	
89-4	13.0 B	4.8 B	4.6 B	2.6 B	
89-9	< 1.0 B	1.2 B	3.3 B	2.6 B	
90-6	-	< 1.0 B	< 1.0 B	< 1.0 B	
92-1	4.5 B	7.7 B	12.0 B	< 1.0 B	
92-2	-	5.6 B	18.0 B	7.0 B	
92-3	-	-	< 1.0 B	< 1.0 B	
92-4	-	-	< 1.0 B	< 1.0 B	
HRO-17	-	8.4 B	9.5 B	-	
L-87-2	380.0 B	-	310.0 B	430.0 B	
L-87-3	57.0 B	52.0 B	17.0 B	15.0 B	
L-87-5	1.9 B	-	4.1 B	2.2 B	
L-87-8	12.0 B	2.0 B	1.0 B	< 1.0 B	
L-88-10	184.0 B	-	100.0 B	130.0 B	
LS-11	73.0 B	50.0 B	54.0 B	43.0 B	
LS-8	78.0 B	54.0 B	12.0 B	-	

Table 4: Chlorobenzene Analytical Results for Ground-Water Samples Collected During Quarterly Sampling Rounds, Livingston Rail Yard, Livingston, Montana.

Chemical Parameter:	<i>Chlorobenzene</i>				Units:	<i>ug/L</i>
<u>Monitoring Well</u>	<u>1992 February Quarterly</u>	<u>1992 May Quarterly</u>	<u>1992 August Quarterly</u>	<u>1992 November Quarterly</u>		
5	< 1.0 B	< 1.0 B	< 1.0 B	< 1.0 B		
89-2	< 1.0 B	< 1.0 B	< 1.0 B	< 1.0 B		
89-3	< 1.0 B	< 1.0 B	< 1.0 B	< 1.0 B		
89-4	< 1.0 B	< 1.0 B	< 1.0 B	< 1.0 B		
89-9	< 1.0 B	< 1.0 B	< 1.0 B	< 1.0 B		
90-6	-	< 1.0 B	< 1.0 B	< 1.0 B		
92-1	< 1.0 B	< 1.0 B	< 1.0 B	< 1.0 B		
92-2	-	< 1.0 B	< 1.0 B	< 1.0 B		
92-3	-	-	< 1.0 B	< 1.0 B		
92-4	-	-	< 1.0 B	< 1.0 B		
HRO-17	-	560.0 B	840.0 B	-		
L-87-2	63.0 B	-	77.0 B	66.0 B		
L-87-3	< 1.0 B	< 1.0 B	1.1 B	< 1.0 B		
L-87-5	< 1.0 B	-	< 1.0 B	< 1.0 B		
L-87-8	< 1.0 B	< 1.0 B	< 1.0 B	< 1.0 B		
L-88-10	8.7 B	-	7.1 B	13.0 B		
LS-11	44.0 B	< 1.0 B	230.0 B	200.0 B		
LS-8	28.0 B	5.3 B	< 1.0 B	-		

APPENDIX A



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

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P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-50578
DATE: 12/22/92

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WATER ANALYSIS

2-88-10

Livingston/BN
140101-1163
Sampled 12/02/92 @ 1230
Submitted 12/04/92
Analyzed 12/11/92

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	13
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	4.5
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	1.2
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	1.7
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	130 *
trans-1,2-Dichloroethene	1.2
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	81 *
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	20
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

*Value derived from a 10X dilution.

REMARKS: This analysis is equivalent to EPA Methods 601/8010.

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Livingston, MT 59047

LAB NO.: 92-50577
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WATER ANALYSIS

Livingston/BN
140101-1162
Sampled 12/02/92 @ 1136
Submitted 12/04/92
Analyzed 12/11/92

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12/22/92

Envirocon, Inc.
Livingston, Mt.

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	2.6
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	200 *
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	2.9
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

*Value derived from a 25X dilution.

REMARKS: This analysis is equivalent to EPA Methods 601/8010.

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Livingston, MT

WATER ANALYSIS

Livingston/BN
140101-1161
Sampled 11/25/92 @ 1600
Submitted 11/30/92
Analyzed 12/09/92

89-3

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	190 *
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

*Value derived from a 100X dilution.

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LAB NO.: 92-49763

DATE: 12/21/92

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Livingston, MT

WATER ANALYSIS

Livingston/BN

140101-1160

Sampled 11/25/92 @ 1506

Submitted 11/30/92

Analyzed 12/09/92

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	2.2
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	72 *
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	4.3
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

*Value derived from a 10X dilution.

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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Livingston, MT 59047

LAB NO.: 92-49762
DATE: 12/21/92 da

WATER ANALYSIS

Livingston/BN
140101-1159
Sampled 11/25/92 @ 1445
Submitted 11/30/92
Analyzed 12/09/92

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Livingston, Mt

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	66 *
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	92 *
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	2.6
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	3.7
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	430 **
trans-1,2-Dichloroethene	4.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	10
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	11
Trichlorofluoromethane	< 1.0
Vinyl chloride	1.2
Dichlorodifluoromethane	< 1.0

*Value derived from a 10X dilution.

**Value derived from a 100X dilution.

NOTE: This analysis is equivalent to EPA Methods 601/8010.

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ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49761
DATE: 12/21/92 da

WATER ANALYSIS

Livingston/BN
140101-1158
Sampled 11/25/92 @ 1327
Submitted 11/30/92
Analyzed 12/10/92

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DEC 22 1992
ENVIROCON, Inc.
Livingston, Mt.

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	5.8
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	0.94
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
FAX (406) 252-6069 • 1-800-735-4489

LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49760 dup
DATE: 12/21/92 da

QUALITY ASSURANCE-DUPLICATE ANALYSIS

Livingston/BN
140101-1157
Sampled 11/25/92 @ 1113
Submitted 11/30/92
Analyzed 12/14/92

L87-3
Lab
Bul

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DEC 22 1992

ENVIROCON, Inc.
Livingston, MT

Constituent	µg/l
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	15
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	100 *
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	11
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

*Value derived from a 10X dilution.

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49760
DATE: 12/21/92

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ENVIROCON, Inc.
Livingston, Mt.

WATER ANALYSIS

Livingston/BN
140101-1157
Sampled 11/25/92 @ 1113
Submitted 11/30/92
Analyzed 12/07/92

L87-3

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	15
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	110 *
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	11
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

*Value derived from a 10X dilution.

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49759
DATE: 12/21/92 da

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ENVIROCON, Inc.
Livingston, Mt.

WATER ANALYSIS

Livingston/BN
140101-1156
Sampled 11/25/92 @ 1046
Submitted 11/30/92
Analyzed 12/07/92

89-2
Field
Dug

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49758
DATE: 12/21/92
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WATER ANALYSIS

Livingston/BN
140101-1155
Sampled 11/25/92 @ 1045
Submitted 11/30/92
Analyzed 12/07/92

89-2

ENVIROCON, Inc.
Livingston, Mt.

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49757
DATE: 12/21/92 da

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ENVIROCON
Livingston

WATER ANALYSIS

Livingston/BN
140101-1154
Sampled 11/25/92 @ 1000
Submitted 11/30/92
Analyzed 12/07/92

LS-11

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	200 *
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	1.0
1,3-Dichlorobenzene	2.5
1,4-Dichlorobenzene	32 **
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	43 **
trans-1,2-Dichloroethene	8.2
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	11
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	12
Trichlorofluoromethane	< 1.0
Vinyl chloride	0.61
Dichlorodifluoromethane	< 1.0

*Value derived from a 25X dilution.

**Value derived from a 10X dilution.

NOTE: This analysis is equivalent to EPA Methods 601/8010.

COMPLETE ENVIRONMENTAL ANALYTICAL SERVICE



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49756
DATE: 12/21/92 da

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WATER ANALYSIS

Livingston/BN
140101-1153
Sampled 11/25/92 @ 0855
Submitted 11/30/92
Analyzed 12/03/92

90-6

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	0.72
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49755
DATE: 12/21/92 da

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WATER ANALYSIS

Livingston/BN
140101-1152
Sampled 11/24/92 @ 1645
Submitted 11/30/92
Analyzed 12/03/92

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	160 *
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

*Value derived from a 10X dilution.

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49754
DATE: 12/21/92 da

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WATER ANALYSIS

Livingston/BN 89-7
140101-1151
Sampled 11/24/92 @ 1610
Submitted 11/30/92
Analyzed 12/03/92

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethyivinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	2.6
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	130 *
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	6.3
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

*Value derived from a 10X dilution.

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49753
DATE: 12/21/92 da

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ENVIROCON, INC.
LABORATORY

WATER ANALYSIS

Livingston/BN 92-4
140101-1150
Sampled 11/24/92 @ 1519
Submitted 11/30/92
Analyzed 12/03/92

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	4.1
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	1.1
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49752
DATE: 12/21/92 da

WATER ANALYSIS

Livingston/BN
140101-1149
Sampled 11/24/92 @ 1445
Submitted 11/30/92
Analyzed 12/03/92

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<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	7.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	37 *
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	3.8
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

*Value derived from a 5X dilution.

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49751
DATE: 12/21/92 da

WATER ANALYSIS

Livingston/BN #6
140101-1148
Sampled 11/24/92 @ 1358
Submitted 11/30/92
Analyzed 12/03/92

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ENERGY LABORATORIES, INC.

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	<1.0
Bromoform	<1.0
Bromomethane	<1.0
Carbon tetrachloride	<0.50
Chlorobenzene	<1.0
Chloroethane	<1.0
2-Chloroethylvinyl ether	<1.0
2-Chlorotoluene	<1.0
Chloroform	<1.0
Chloromethane	<1.0
Dibromochloromethane	<1.0
1,2-Dichlorobenzene	<1.0
1,3-Dichlorobenzene	<1.0
1,4-Dichlorobenzene	<0.50
1,1-Dichloroethane	<1.0
1,2-Dichloroethane	<0.50
1,1-Dichloroethene	<0.50
cis-1,2-Dichloroethene	<1.0
trans-1,2-Dichloroethene	<1.0
1,2-Dichloropropane	<1.0
cis-1,3-Dichloropropene	<1.0
trans-1,3-Dichloropropene	<1.0
Methylene chloride	<1.0
1,1,2,2-Tetrachloroethane	<1.0
Tetrachloroethene	2.1
1,1,1-Trichloroethane	<0.50
1,1,2-Trichloroethane	<1.0
Trichloroethene	<0.50
Trichlorofluoromethane	<1.0
Vinyl chloride	<0.50
Dichlorodifluoromethane	<1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49750 dup
DATE: 12/21/92 da

QUALITY ASSURANCE-DUPLICATE ANALYSIS

Livingston/BN
140101-1147
Sampled 11/24/92 @ 1357
Submitted 11/30/92
Analyzed 12/10/92

#6
Dup
Lab

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DEC 22 1992
E. J. ...

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	<1.0
Bromoform	<1.0
Bromomethane	<1.0
Carbon tetrachloride	<0.50
Chlorobenzene	<1.0
Chloroethane	<1.0
2-Chloroethylvinyl ether	<1.0
2-Chlorotoluene	<1.0
Chloroform	<1.0
Chloromethane	<1.0
Dibromochloromethane	<1.0
1,2-Dichlorobenzene	<1.0
1,3-Dichlorobenzene	<1.0
1,4-Dichlorobenzene	<0.50
1,1-Dichloroethane	<1.0
1,2-Dichloroethane	<0.50
1,1-Dichloroethene	<0.50
cis-1,2-Dichloroethene	<1.0
trans-1,2-Dichloroethene	<1.0
1,2-Dichloropropane	<1.0
cis-1,3-Dichloropropene	<1.0
trans-1,3-Dichloropropene	<1.0
Methylene chloride	<1.0
1,1,2,2-Tetrachloroethane	<1.0
Tetrachloroethene	1.7
1,1,1-Trichloroethane	<0.50
1,1,2-Trichloroethane	<1.0
Trichloroethene	<0.50
Trichlorofluoromethane	<1.0
Vinyl chloride	<0.50
Dichlorodifluoromethane	<1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1107 SOUTH BROADWAY • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
FAX (406) 252-6069 • 1-800-735-4489

LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49750
DATE: 12/21/92 da

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ENVIRONMENTAL
LABORATORY

WATER ANALYSIS

Livingston/BN #6
140101-1147
Sampled 11/24/92 @ 1357
Submitted 11/30/92
Analyzed 12/03/92

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	2.0
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49749
DATE: 12/21/92 da

WATER ANALYSIS

Livingston/BN
140101-1146
Sampled 11/24/92 @ 1317
Submitted 11/30/92
Analyzed 12/03/92

#5

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Envirocon, Inc.
Livingston, MT

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49748
DATE: 12/21/92 da

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ENVIRONMENTAL

WATER ANALYSIS

Livingston/BN
140101-1145
Sampled 11/24/92 @ 1218
Submitted 11/30/92
Analyzed 12/03/92

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	<1.0
Bromoform	<1.0
Bromomethane	<1.0
Carbon tetrachloride	<0.50
Chlorobenzene	<1.0
Chloroethane	<1.0
2-Chloroethylvinyl ether	<1.0
2-Chlorotoluene	<1.0
Chloroform	<1.0
Chloromethane	<1.0
Dibromochloromethane	<1.0
1,2-Dichlorobenzene	<1.0
1,3-Dichlorobenzene	<1.0
1,4-Dichlorobenzene	<0.50
1,1-Dichloroethane	<1.0
1,2-Dichloroethane	<0.50
1,1-Dichloroethene	<0.50
cis-1,2-Dichloroethene	<1.0
trans-1,2-Dichloroethene	<1.0
1,2-Dichloropropane	<1.0
cis-1,3-Dichloropropene	<1.0
trans-1,3-Dichloropropene	<1.0
Methylene chloride	<1.0
1,1,2,2-Tetrachloroethane	<1.0
Tetrachloroethene	0.70
1,1,1-Trichloroethane	<0.50
1,1,2-Trichloroethane	<1.0
Trichloroethene	<0.50
Trichlorofluoromethane	<1.0
Vinyl chloride	<0.50
Dichlorodifluoromethane	<1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49747
DATE: 12/21/92 da

WATER ANALYSIS

Livingston/BN
140101-1144
Sampled 11/24/92 @ 1140
Submitted 11/30/92
Analyzed 12/03/92

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ENVIRONMENTAL
LABORATORY

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	1.0
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49746
DATE: 12/21/92 da

WATER ANALYSIS

Livingston/BN
140101-1143
Sampled 11/24/92 @ 1040
Submitted 11/30/92
Analyzed 12/03/92

92-3

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DEC 21 1992

ENVIROCON, INC.
Livingston, MT

Constituent

µg/l

Purgeable Halocarbons (EPA Method 624)

Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49745
DATE: 12/21/92 da

WATER ANALYSIS

Livingston/BN
140101-1142
Sampled 11/24/92 @ 0745
Submitted 11/30/92
Analyzed 12/03/92

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ENVIROCON, INC.
Livingston, MT

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: Blank
DATE: 12/22/92 da

WATER ANALYSIS

Method Blank
Analyzed 12/11/92

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<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

REMARKS: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

21/2/22
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TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: Blank
DATE: 12/21/92 da

DEC 22 1992

ENVIROCON, Inc.
Livingston, MT

WATER ANALYSIS

Method Blank
Analyzed 12/03/92

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



ENERGY LABORATORIES, INC.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: Blank
DATE: 12/21/92

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ENVIROCON, Inc.
Livingston Mt.

WATER ANALYSIS

Method Blank
Analyzed 12/07/92

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: Blank
DATE: 12/21/92 da

RECEIVED
DEC 22 1992
ENVIROCON, Inc.
Livingston, Mt.

WATER ANALYSIS

Method Blank
Analyzed 12/09/92

<u>Constituent</u>	<u>ug/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: Blank
DATE: 12/21/92 da

RECEIVED

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ENVIROCON, Inc.
Livingston, Mt

WATER ANALYSIS

Method Blank
Analyzed 12/10/92

<u>Constituent</u>	<u>µg/l</u>
Purgeable Halocarbons (EPA Method 624)	
Bromodichloromethane	< 1.0
Bromoform	< 1.0
Bromomethane	< 1.0
Carbon tetrachloride	< 0.50
Chlorobenzene	< 1.0
Chloroethane	< 1.0
2-Chloroethylvinyl ether	< 1.0
2-Chlorotoluene	< 1.0
Chloroform	< 1.0
Chloromethane	< 1.0
Dibromochloromethane	< 1.0
1,2-Dichlorobenzene	< 1.0
1,3-Dichlorobenzene	< 1.0
1,4-Dichlorobenzene	< 0.50
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 0.50
1,1-Dichloroethene	< 0.50
cis-1,2-Dichloroethene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Methylene chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 0.50
1,1,1-Trichloroethane	< 0.50
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 0.50
Trichlorofluoromethane	< 1.0
Vinyl chloride	< 0.50
Dichlorodifluoromethane	< 1.0

NOTE: This analysis is equivalent to EPA Methods 601/8010.

**ENERGY LABORATORIES, INC.**

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FAX (406) 252-6069 • 1-800-735-4489

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DEC 22 1992

LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49751
DATE: 12/21/92 da

ENVIROCON, Inc.
Livingston, MT

QUALITY ASSURANCE-SPIKED ANALYSIS

Lab No. 92-49751 was spiked with the following
constituents with these results for Envirocon samples on 12/14/92:

<u>Constituent</u>	<u>Spike Amount</u> <u>µg/l</u>	<u>P (%)</u>	<u>Range for</u> <u>P (%)</u>
Chlorobenzene	5.0	104	60-140
1,2-Dichlorobenzene	5.0	96	60-140
cis-1,2-Dichloroethylene	5.0	107	60-140
trans-1,2-Dichloroethylene	5.0	101	60-140
1,2-Dichloropropane	5.0	107	60-140
Ethylbenzene	5.0	80	60-140
Styrene	5.0	64	60-140
Tetrachloroethylene	5.0	94	60-140
Toluene	5.0	94	60-140
o-Xylene	5.0	76	60-140
p-Xylene	5.0	70	60-140

P = Percent recovery measured.

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Livingston

LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49759
DATE: 12/21/92 da

QUALITY ASSURANCE-SPIKED ANALYSIS

Lab No. 92-49759 was spiked with the following
constituents with these results for Envirocon samples on 12/14/92:

<u>Constituent</u>	<u>Spike Amount</u> <u>µg/l</u>	<u>P (%)</u>	<u>Range for</u> <u>P (%)</u>
Chlorobenzene	5.0	114	60-140
1,2-Dichlorobenzene	5.0	102	60-140
cis-1,2-Dichloroethylene	5.0	108	60-140
trans-1,2-Dichloroethylene	5.0	116	60-140
1,2-Dichloropropane	5.0	110	60-140
Ethylbenzene	5.0	102	60-140
Styrene	5.0	89	60-140
Tetrachloroethylene	5.0	103	60-140
Toluene	5.0	106	60-140
o-Xylene	5.0	94	60-140
p-Xylene	5.0	100	60-140

P = Percent recovery measured.

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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49745 -64
DATE: 12/21/92 da

ENVIROCON, Inc.
Livingston, Mt.

EPA WATER SUPPLY QUALITY CONTROL SAMPLE**Volatile Organic Contaminants**

This EPA Quality Control sample was analyzed with your lab no.s
92-49745 through 92-49764 with the following results:

<u>Parameter</u>	<u>True Value, $\mu\text{g/l}$</u>	<u>P (%)</u>	<u>Range for P (%)</u>
1,1-Dichloroethene	5.0	92	60-140
trans-1,2-Dichloroethene	5.0	96	60-140
1,2-Dichloroethane	5.0	100	60-140
Carbon Tetrachloride	5.0	108	60-140
1,2-Dichloropropane	5.0	114	60-140
1,1,2-Trichloroethane	5.0	123	60-140
Tetrachloroethene	5.0	102	60-140
Chlorobenzene	5.0	121	60-140
Ethylbenzene	5.0	90	60-140
1,3-Dichlorobenzene	5.0	95	60-140
1,4-Dichlorobenzene	5.0	94	60-140

P = Percent recovery measured.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-49745 -64
DATE: 12/21/92 da

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Livingston, MT

WATER VOLATILE SURROGATE RECOVERY

10 µg/l Surrogate Standard Spike

<u>SAMPLE NO.</u>	-----% recovery-----		
	<u>S1</u> <u>(TOL)#</u>	<u>S2</u> <u>(BFB)#</u>	<u>S3</u> <u>(DCE)#</u>
92-49745	102	100	107
92-49746	101	97	108
92-49747	103	96	104
92-49748	99	99	99
92-49749	101	96	102
92-49750	100	100	100
92-49750 dup	98	112	93
92-49751	103	96	108
92-49752	101	94	104
92-49753	102	92	103
92-49754	101	95	102
92-49755	102	94	104
92-49756	103	98	101
92-49757	96	96	105
92-49758	97	96	103
92-49759	98	93	104
92-49760	99	98	105
92-49760 dup	100	109	107
92-49761	95	114	89
92-49762	92	120	95
92-49763	102	98	97
92-49764	97	96	94
Blank	100	100	100
Blank	101	105	88
Blank 12/03/92	100	106	90
Blank 12/07/92	96	103	84

S1 (TOL) = Toluene-d8
S2 (BFB) = Bromofluorobenzene
S3 (DCE) = 1,2-Dichloroethane-d4

QC LIMITS, % Recovery

80-120
80-120
80-120

#Column to be used to flag recovery values with an asterisk.



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LABORATORY REPORT

TO: John Mills
ADDRESS: Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

LAB NO.: 92-50577 -78
DATE: 12/22/92 da

WATER VOLATILE SURROGATE RECOVERY

10 µg/l Surrogate Standard Spike

<u>SAMPLE NO.</u>	-----% recovery-----		
	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#
92-50577	100	102	108
92-50578	100	100	100
Blank	102	102	106

S1 (TOL) = Toluene-d8
S2 (BFB) = Bromofluorobenzene
S3 (DCE) = 1,2-Dichloroethane-d4

QC LIMITS, % Recovery
80-120
80-120
80-120

#Column to be used to flag recovery values with an asterisk.

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Livingston, Mt.



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DEC 28 1992

December 22, 1992

John Mills
Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

On December 04, 1992 these samples, represented by our laboratory numbers 92-50577 to 92-50578, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by: *Joe Stander*



ENERGY LABORATORIES, INC.

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11/2/22
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ENVIROCON
LIVINGSTON

December 21, 1992

John Mills
Envirocon, Inc.
P.O. Box 1154
Livingston, MT 59047

On November 30, 1992 these samples, represented by our laboratory numbers 92-49745 to 92-49764, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by: *for Standards*

DATA VALIDATION REPORT FOR GROUNDWATER ANALYSES LIVINGSTON RAIL YARD, LIVINGSTON, MONTANA NOVEMBER 1992 QUARTERLY SAMPLING ROUND

1.0 INTRODUCTION

Data validation levels have been established for the sample round according to the criteria described in Appendix 1.A of the Remedial Investigation Report. The data validation levels and codes for the Livingston Rail Yard project are based on the U.S. Environmental Protection Agency Region VIII guidance, "Evaluation Criteria for Existing Data from CERCLA Study Areas", Revision 1, January 5, 1985.

Table 1 lists all the sample station names, sample dates, Envirocon field identification number, laboratory identification number, and analytical methods for the November 1992 quarterly sampling round.

Table 1. Samples collected for analyses during the November, 1992 Quarterly Sampling Round

<u>Sample Station</u>	<u>Sample Type</u>	<u>Date Sampled</u>	<u>Date Analyzed</u>	<u>Envirocon Field ID #</u>	<u>Laboratory ID #</u>
1	Primary Sample	11/24/92	12/03/92	140101-1144	92-49747
2	Primary Sample	11/24/92	12/03/92	140101-1145	92-49748
5	Primary Sample	11/24/92	12/03/92	140101-1146	92-49749
6	Primary Sample	11/24/92	12/03/92	140101-1147	92-49750
6	Laboratory Duplicate	11/24/92	12/10/92	140101-1147	92-49750 dup
6	Field Duplicate	11/24/92	12/03/92	140101-1148	92-49751
89-2	Primary Sample	11/25/92	12/07/92	140101-1155	92-49758
89-2	Field Duplicate	11/25/92	12/07/92	140101-1156	92-49759
89-3	Primary Sample	11/25/92	12/09/92	140101-1161	92-49764
89-4	Primary Sample	12/02/92	12/11/92	140101-1162	92-50577
89-9	Primary Sample	11/24/92	12/03/92	140101-1151	92-49754
90-6	Primary Sample	11/25/92	12/03/92	140101-1153	92-49756
92-1	Primary Sample	11/24/92	12/03/92	140101-1152	92-49755
92-2	Primary Sample	11/24/92	12/03/92	140101-1149	92-49752
92-3	Primary Sample	11/24/92	12/03/92	140101-1143	92-49746
92-4	Primary Sample	11/24/92	12/03/92	140101-1150	92-49753
L-87-2	Primary Sample	11/25/92	12/07/92	140101-1159	92-49762
L-87-3	Primary Sample	11/25/92	12/07/92	140101-1157	92-49760
L-87-3	Laboratory Duplicate	11/25/92	12/14/92	140101-1157	92-49760 dup
L-87-5	Primary Sample	11/25/92	12/09/92	140101-1160	92-49763
L-87-8	Primary Sample	11/25/92	12/10/92	140101-1158	92-49761
L-88-10	Primary Sample	12/02/92	12/11/92	140101-1163	92-50578
LS-11	Primary Sample	11/25/92	12/07/92	140101-1154	92-49757

Analytical Method: Purgeable Halocarbons (EPA Method 624)

2.0 EVALUATION OF BLANK ANALYSES

Laboratory and trip blanks analyzed for this sampling round are summarized in Table 2. Contaminants found are summarized in Table 3. All blank analyses are presented at the end of this report.

Table 2. Laboratory and Trip Blanks analyzed during the November, 1992 Quarterly Sampling Round

<u>Sample Station</u>	<u>Sample Type</u>	<u>Date Sampled</u>	<u>Date Analyzed</u>	<u>Envirocon Field ID #</u>	<u>Laboratory ID #</u>
Blank	Trip Blank	11/24/92	12/03/92	140101-1142	92-49745
Blank	Laboratory Blank		12/03/92		Blank
Blank	Laboratory Blank		12/07/92		Blank
Blank	Laboratory Blank		12/09/92		Blank
Blank	Laboratory Blank		12/10/92		Blank
Blank	Laboratory Blank		12/11/92		Blank

Analytical Method: Purgeable Halocarbons (EPA Method 624)

3.0 EVALUATION OF DUPLICATE ANALYSES

Field and laboratory duplicates, as well as second laboratory splits collected during this sampling round are summarized in Table 3. All duplicate sample results had relative percent differences less than 30%, successfully meeting the duplicate comparison criterion.

Table 3. Duplicate Samples analyzed during the November, 1992 Quarterly Sampling Round

<u>Sample Station</u>	<u>Sample Type</u>	<u>Date Sampled</u>	<u>Date Analyzed</u>	<u>Envirocon Field ID #</u>	<u>Laboratory ID #</u>
6	Laboratory Duplicate	11/24/92	12/10/92	140101-1147	92-49750 dup
89-2	Field Duplicate	11/25/92	12/07/92	140101-1156	92-49759
L-87-3	Laboratory Duplicate	11/25/92	12/14/92	140101-1157	92-49760 dup

Analytical Method: Purgeable Halocarbons (EPA Method 624)

4.0 EVALUATION OF HOLDING TIMES

Analyses which exceeded holding time criteria are summarized in Table 4. Because samples are laboratory duplicates and all computed relative percent differences with primary results are within 30%, the affected analyte concentrations are considered qualitative as listed in Table 5.

Table 4. Summary of analyses which exceeded holding time restrictions

<u>Sample Station</u>	<u>Sample Type</u>	<u>Date Sampled</u>	<u>Date Analyzed</u>	<u>Envirocon Field ID #</u>	<u>Laboratory ID #</u>
6	Laboratory Duplicate	11/24/92	12/10/92	140101-1147	92-49750 dup

Table 4. (cont.) Summary of analyses which exceeded holding time restrictions

<u>Sample Station</u>	<u>Sample Type</u>	<u>Date Sampled</u>	<u>Date Analyzed</u>	<u>Envirocon Field ID #</u>	<u>Laboratory ID #</u>
L-87-3	Laboratory Duplicate	11/25/92	12/14/92	140101-1157	92-49760 dup

Analytical Method: Purgeable Halocarbons (EPA Method 624)

5.0 EVALUATION OF MATRIX AND SURROGATE SPIKE RESULTS

All matrix spike and surrogate spike recoveries were within acceptable limits. All U.S. Environmental Protection Agency water supply quality control samples were within recovery limits. The matrix spike, surrogate spike, and U.S. EPA water supply quality control sample results are provided at the end of this report.

6.0 VALIDATION LEVEL ASSIGNMENTS

Analytical results are acceptable for quantitative data analysis for this sampling round with the exception of the sample results summarized in Table 5 (qualitative results).

Table 5. Validation results - analytical results flagged as non-quantitative

<u>Sample Station</u>	<u>Date Sampled</u>	<u>Date Analyzed</u>	<u>Sample Type</u>	<u>Envirocon Field ID #</u>	<u>Laboratory ID #</u>
6	11/24/92	12/10/92	Laboratory Duplicate	140101-1147	92-49750 dup

<u>Analyte Affected</u>	<u>Concentration</u>	<u>Validation</u>	<u>Reason</u>
Bromodichloromethane	< 1.0ug/l	Screening	Holding Time
Bromomethane	< 1.0ug/l	Screening	Holding Time
Chlorobenzene	< 1.0ug/l	Screening	Holding Time
2-Chloroethyl vinyl ether	< 1.0ug/l	Screening	Holding Time
Chloroform	< 1.0ug/l	Screening	Holding Time
Dibromochloromethane	< 1.0ug/l	Screening	Holding Time
1,3-Dichlorobenzene	< 1.0ug/l	Screening	Holding Time
1,1-Dichloroethane	< 1.0ug/l	Screening	Holding Time
1,1-Dichloroethene	< 0.5ug/l	Screening	Holding Time
trans-1,2-Dichloroethene	< 1.0ug/l	Screening	Holding Time
cis-1,3-Dichloropropene	< 1.0ug/l	Screening	Holding Time
Methylene chloride	< 1.0ug/l	Screening	Holding Time
Tetrachloroethene	< 1.7ug/l	Screening	Holding Time
1,1,2-Trichloroethane	< 1.0ug/l	Screening	Holding Time
Trichlorofluoromethane	< 1.0ug/l	Screening	Holding Time
Dichlorodifluoromethane	< 1.0ug/l	Screening	Holding Time

<u>Sample Station</u>	<u>Date Sampled</u>	<u>Date Analyzed</u>	<u>Sample Type</u>	<u>Envirocon Field ID #</u>	<u>Laboratory ID #</u>
L-87-3	11/25/92	12/14/92	Laboratory Duplicate	140101-1157	92-49760 dup

<u>Analyte Affected</u>	<u>Concentration</u>	<u>Validation</u>	<u>Reason</u>
Bromodichloromethane	< 1.0ug/l	Screening	Holding Time
Bromomethane	< 1.0ug/l	Screening	Holding Time

Table 5. (cont.) Validation results - analytical results flagged as non-quantitative

<u>Analyte Affected</u>	<u>Concentration</u>	<u>Validation</u>	<u>Reason</u>
Chlorobenzene	< 1.0ug/l	Screening	Holding Time
2-Chloroethyl vinyl ether	< 1.0ug/l	Screening	Holding Time
Chloroform	< 1.0ug/l	Screening	Holding Time
Dibromochloromethane	< 1.0ug/l	Screening	Holding Time
1,3-Dichlorobenzene	< 1.0ug/l	Screening	Holding Time
1,1-Dichloroethane	< 1.0ug/l	Screening	Holding Time
1,1-Dichloroethene	< 0.5ug/l	Screening	Holding Time
trans-1,2-Dichloroethene	< 1.0ug/l	Screening	Holding Time
cis-1,3-Dichloropropene	< 1.0ug/l	Screening	Holding Time
Methylene chloride	< 1.0ug/l	Screening	Holding Time
Tetrachloroethene	100.0ug/l	Screening	Holding Time
1,1,2-Trichloroethane	< 1.0ug/l	Screening	Holding Time
Trichlorofluoromethane	< 1.0ug/l	Screening	Holding Time
Dichlorodifluoromethane	< 1.0ug/l	Screening	Holding Time

